SYERS-2
Modification Number 99-030

Keith Thomas

29 Jul 2004

SYERS-2 Presentation

- 1 SYERS-2 Migration to ATM
- 2 SYERS-2 Background Charts
- 3 SYERS-2 DCGS
- 4 SYERS-2 Program Issues
- 5 Backup Charts

SYERS-2 Migration to ATM

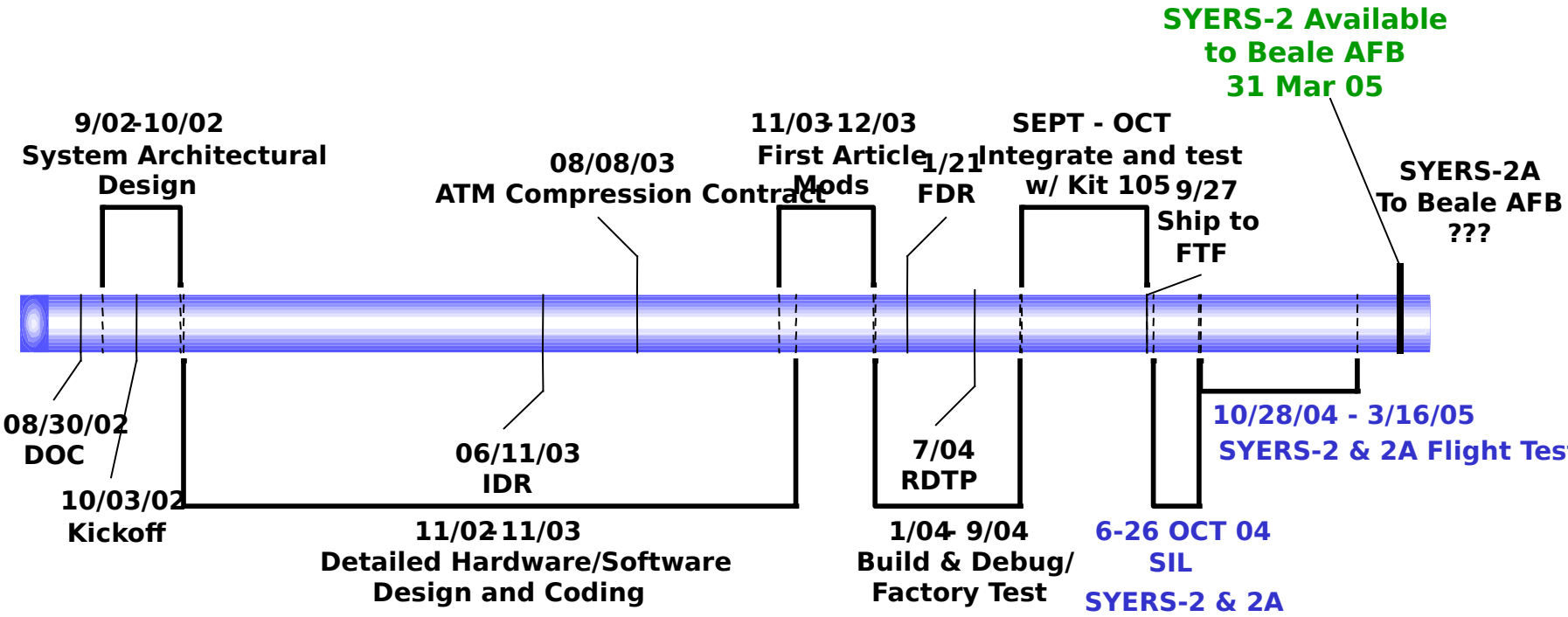
SYERS-2 Migration to ATM

- Design & FT Phase (On Contract/underway):
  - Airborne:
    - S/N 007 PCU is Modified and T&C modification is underway
  - Ground:
    - Update Site 2 for SYERS-2 ATM (CIP)
  - Test:
    - Use time on available SYERS-2 Kit 105 at Site 2 to Flight Test SYERS-2A configuration
  - Conclusion:
    - Review results

SYERS-2 Migration to ATM

- Mods Phase (On Contract/starts after FT)
  - Ground: Update SYERS-2 CIP's for ATM in all applicable locations
    - Part of 10.2
  - Airborne:
    - TCTO generation and approval process
    - Update PCU and T&C at each location
      - 2 possibilities; may use some of each:
        - » Mod unit at site using kit of parts … shortest overall program time
        - » Cycle updated whole units to site … quickest upgrade at a given site

SYERS-2A Schedule



Note: SYERS-2A delivery date to Beale AFB dependant upon T
L-3Com & LM-Aero Tech Data changes as well as DCGS 10.2/C

LM-Aero SIL/Flt Test Milestones

Kits	GFE Kit Available	TCTO Kits (ECD)	Inspect & Repair	Kit Mod (ECD)	SIL (ECD)	Flight Test (ECD)	Available
104	11/1/02 *	Complete	Complete	Complete	Complete	Complete	Delivered
105	06/12/03*	Complete	8/26/04	8/26/04	S2 6-8 Oct 04 S2A 8-22 Oct 04	10/28/04 – 3/16/05	3/31/05 **
106	8/2/04	Complete	1/27/05	1/27/05	1/28/05 – 2/3/05	3/11/05 ** – 7/1/05	7/21/05 **

Note: ***Schedule Forecast based upon:***

- ***4 month repair span for receipt of unsuitable GFE for Kit 105 (Nose and Control Panel).***
- ***LX direction to reflect new GFE delivery dates for Kits 104, 105, and 106 and increased Flight Test spans of 1 month/kit.***

**** GFE received for Kit 104 approx. 1 year late. GFE for Kit 104 & 105 required complete refurbishment.***

***** SYERS-2 Only, SYERS-2A will have complete flt testing, but requires TCTO's and L-3***

Background Charts

SYERS-2

Airborne Equipment

RX-533-600 Kit

Nose Components:

7 band EO Sensor in a rotating nose slaved to internally computed pointing angle. Imagery collected in push-broom fashion. Targets selectable from horizon to horizon. Stabilized Line of Sight. F/O interface to Q-Bay.

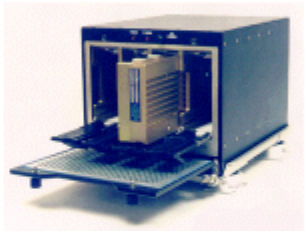
Cockpit Components:

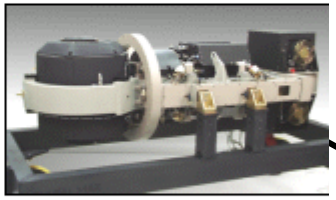
SYERS Control Panel and Mark IV Hand Controll

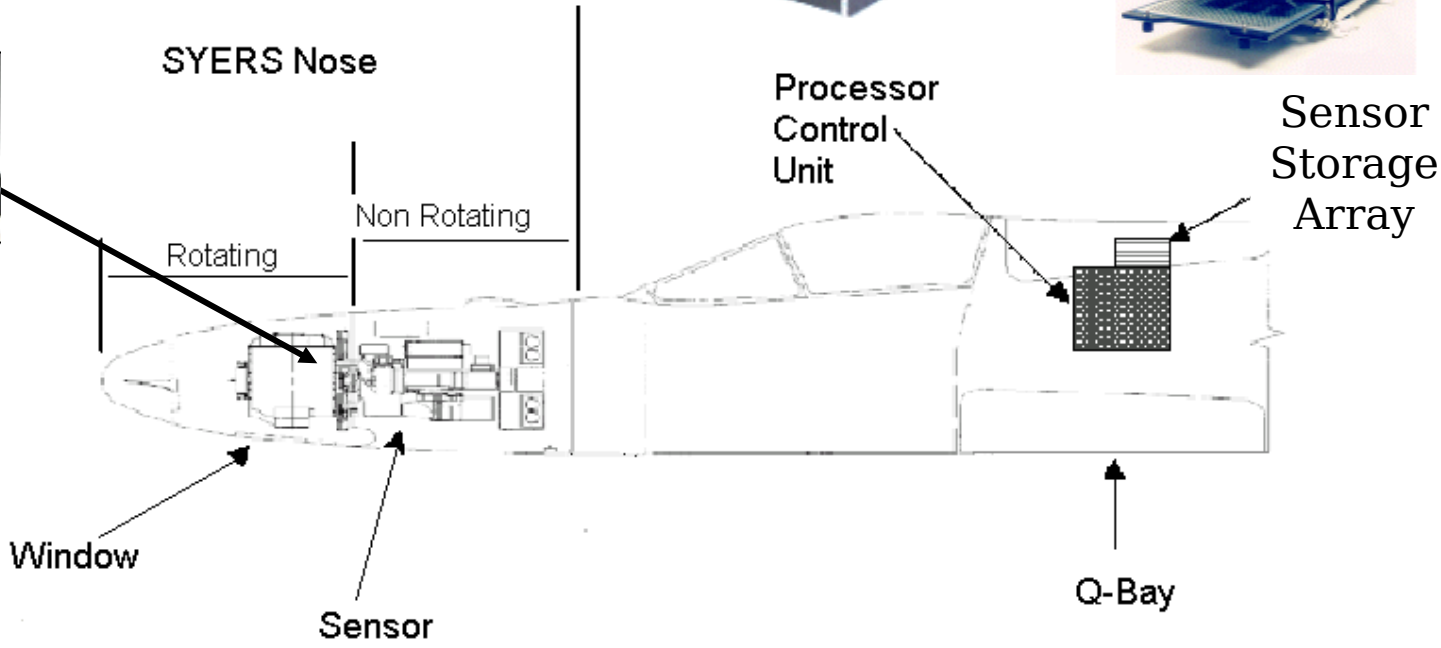
Q-Bay components:

PCU Interfaces Sensor to Data Link or SSA. F/O interface to HR Link channels and Sensor.
SSA Provide
144GByte

Changes for ATM (Same Envelope)







Airborne Status: Fielded

Kit 101 & 104 Current Status:
At Det 4: FMC

Kit 102 Current Status:
At Osan: NMC

Kit 103 Current Status:
At Beale AFB: FMC
Scheduled to Fly 17 & 23 Aug 04

Airborne Status: Not Fielded

Kit 105 Current Status:
Goodrich Depot: Undergoing Factory Acceptance Test
Available to ship to FTF ~ 27 Sep 04
SYERS-2 SIL: 6-8 Oct 04
SYERS-2A SIL: 8-26 Oct 04

Kit 106 Current Status:
Ship to FTF: Dependant upon Legacy SYERS RX Kit turn in date.

Need RX/TX Cards
Or go direct to ATM

SQWAP

- Size, Thermal Dissipation, Weight, and Power
  - There are No Issues for SYERS-2 … everything is in compliance
  - ATM: SYERS-2A analytical inputs due at FDR (Complete)

Details

SYERS-2 ICD's

ICD #	ICD Topic	Rev	Rev Date
ES268494	SYERS-2A Airborne Electrical ICD	-	20 Jan 04
261680	Sensor Space Envelope	-	04 Feb 98
139329	PCU Outline & Mounting	-	01 Feb 99
268209	SSA Mechanical ICD	-	06 Oct 99
ES268492	SYERS-2A SSA S/W ICD	-	20 Jan 04
ES268457	SYERS-2A Airborne to Ground ICD	-	01 Feb 04

GSE List & Status

All GSE now in place for Kit's 101-106

GSE Item Description	Qty Required	Qty Now in Build/Completed
Telescope Protective Covers	6	All completed
Sensor Dust Covers	6	All completed
Shipping Containers	6 Sets	All Completed
Insertion Fixture	6	All completed
Maintenance Dolly	6	All completed
Lifting Fixture	6	All completed
T&C Consoles	7	All completed.

Note: 1 Test & Checkout Console is SYERS-2 & SYERS-2A capable.

SYERS-2 Spares

KIT #	101	102	103	104	105
Sensor: 33 line items	**DSL Complete***	DSL Complete*	DSL Complete*	DSL Complete*	DSL in work*
PCU 27 line items	DSL Complete	DSL Complete	DSL Complete	DSL Complete	DSL in work**
T&C 73 line items	DSL Complete	DSL Complete	DSL Complete	DSL Complete	DSL in work**
SSA 2 line items	DSL Complete	DSL Complete	DSL Complete	DSL Complete	DSL in work**

Notes: * Focal Plane Spares are held at Depot (Chelmsford)

** These parts are on hand at WR-ALC /LX

All parts held at Goodrich Depot are available for direct next-day priority shipmen

SYERS-2 IR FPA Status

- IR Focal Plane Assembly
  - 12 purchased, Northrop Grumman Electro Optics
    - 4 Installs, Kit 101, 102, 103 & 104
    - 5 in rework at vendor
      - 1 (suitable for lab work) supporting Kit 105 integration
    - 2 on contract, in build, to deliver Oct 04
    - 1 being used in the SYERS-2 Polarimetric Demo
      - Requires retro fit (6 month), completion TBD

IR FPA Asset Allocation

- LT-2 available 20 Aug 04
  - Recommend spare
- LT-6 available 27 Aug 04
  - Recommend spare
- LT-5 available 29 Oct 04
  - Recommend spare
- LT-7 available 31 Dec 04
  - Recommend spare

SYERS-2 IR FPA Status

- NG Management engaged at VP level to address continuous reliability problems & provide engineering support
  - TAA completed for critical, non US Mux Designer
  - Current NG personnel assignments modified to ensure sufficient manpower allocated to tasks
  - NG EOS asked to provide additional assistance from other NG divisions
- Goodrich assigned task management staff
  - Presence at NG & technical assistance

SYERS-2 IR FPA Status

IR FPA SubSystem	Leos ID	Current Location	Comment/ Status	Expected Availability
S/N 000	LT1	Beale AFB, Kit 103	Currently supporting Training flts @ Beale AFB	
S/N 001	LT2	Tempe, AZ - NG EOS	SCAF replacement in process	20-Aug-04
S/N 002	LT3	Osan - 5RS, Kit 102	Operational	
S/N 003	LT5	Tempe, AZ - NG EOS	Cooler repair and SCAF replacement required	29-Oct-04
S/N 004	LT4	Det 4, Kit 101	Operational (extended cooldown problem)	
S/N 007	LT6	Tempe, AZ - NG EOS	Evaluation in process. Funding authorized to start repair.	27-Aug-04
S/N 006	LT7	Chelmsford, MA	Rt'ned to depot (unservicable) for use in Kit 105 integration	31-Dec-04
			to allow return of LT5 for diagnosis of suspected cooler problem	
S/N 005	LT8	Tempe, AZ - NG EOS	Noise issues still unresolved.	TBD
S/N 008	LT9	Det 4, Kit 104	Operational	

Tech Data

- SYERS-2 Tech Data have initial updates:
  - U-2S-1/Check List U-2S 2-1
  - U-2S 2-2 U-2S 2-4
  - U-2S 2-12*

  * Goodrich has submitted a technical notice clarifying the sensor cooling requirements.
- Goodrich drawings for CFSR support
  - Paper files for most used; CD files for full set
  - Includes:
    - Assembly drawings/procedures Schematics
    - Wire Lists Parts Lists Specifications
    - ICD's Test Procedures
  - Packages sent to Palmdale, DGS1/2/3, Det 4 & Beale AFB.
- All source data updates are posted to LiveLink and are accessible to the CFSR's

Pending TCTO Status

TCTO ID	TCTO Topic	Status
TO:31S7-SYERS2-509	INTEGRATION OF (SYERS) GROUND SEGMENT (GSEG) AT THE FORWARD OPERATING LOCATION (FOL)	LXET 7/19/04
TO:31S7-SYERS2-510	INSTALL (SYERS) GROUND SEGMENT AT DGS-4	LXET 7/19/04
TO:31S7-SYERS2-511	INSTALLATION CIP AT THE FOL	LXET 7/19/04
TO:31S7-SYERS2-504	Install DST DR into SFEP	LXET Request Additional Info 7/16/04
TO:12S3-4-SYERS2-501	Suspension: Inspect/Repair	LXET 7/19/04

SYERS-2 Training

- **IA's; Mission Planners; Collection Managers:**
  - Course materials completed & up to date
  - Courses have been completed at DGS-2/3/4
  - Training has not been conducted at DGS-1
  - DGS-3 needs to have retraining scheduled
  - Collection Management training recommended for CENTCOM & CENTAF
  - Funded to return to DGS-4

- **Maintenance of SYERS-2 Sensor is total CFSR**
  - Formal training for all deployed sites has been

Data Link BW Management

SYERS Allocated Link Usage	Return Channel	Command Channel
SYERS-2 (Non ATM)	Q1; Q2; Q3; I1-6; I2; I3 Net = 215.7 Mbit/sec	Channel 6 Net = 50 Kbit/sec
SYERS-2A (ATM; with compression)	Two OC-3c Ports	
	Net (Incl. OH's) 199.2 Mbit/sec	Net (Incl. OH's) 1.455 Mbit/sec

DCGS

SYERS-2 Ground

Chris Johnson

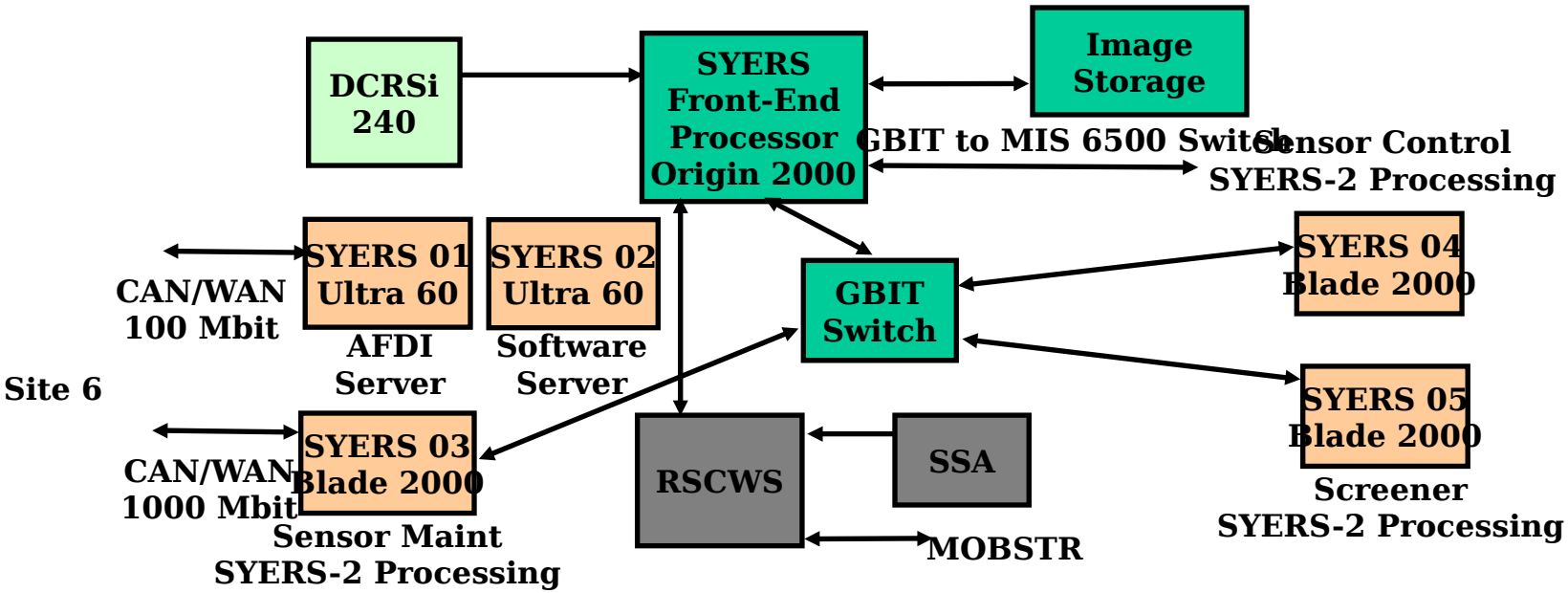
Ground IMINT Lead 478-926-8448

chris.johnson@robins.af.mil

DGS-1

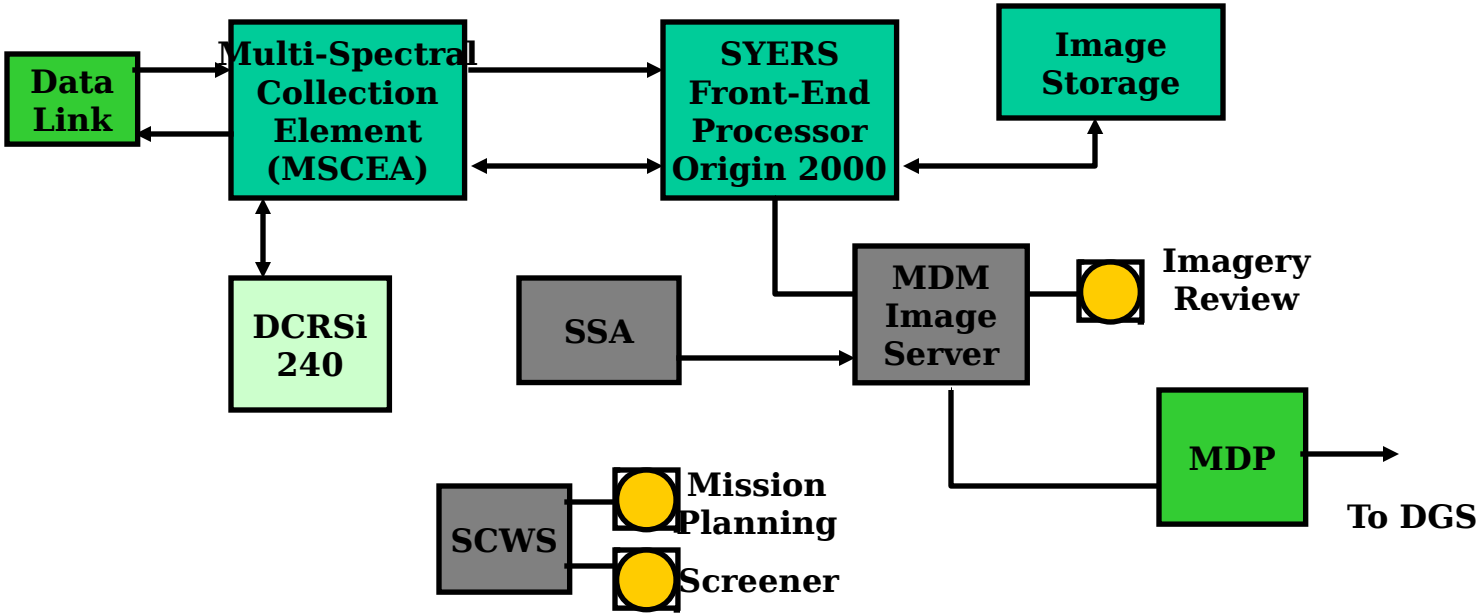
- Status
  - DTS Integration completed
  - Upgrades coordinated with IPE Thread 1 install/test at Site-6
    - Upgrades required for SYERS backend to support upgraded ETP architecture, action boarded/approved: 1067: 04-002
  - Supported Integration of CALA IPL capability
    - Employed for every MOBSTR B mission
  - Providing initial support to Collection Management Mission Applications (CMMA)
  - Upgraded AFDI
  - Upgraded to CSP v 2.0

DGS-1 con't



- Remaining Tasks
  - CIES Integration Support
  - Network Upgrades (On Going)
  - SSA Playback Integration
  - CMMA Ongoing Efforts
  - Support for 2nd Operational Thread at Site-6

MOBSTR B

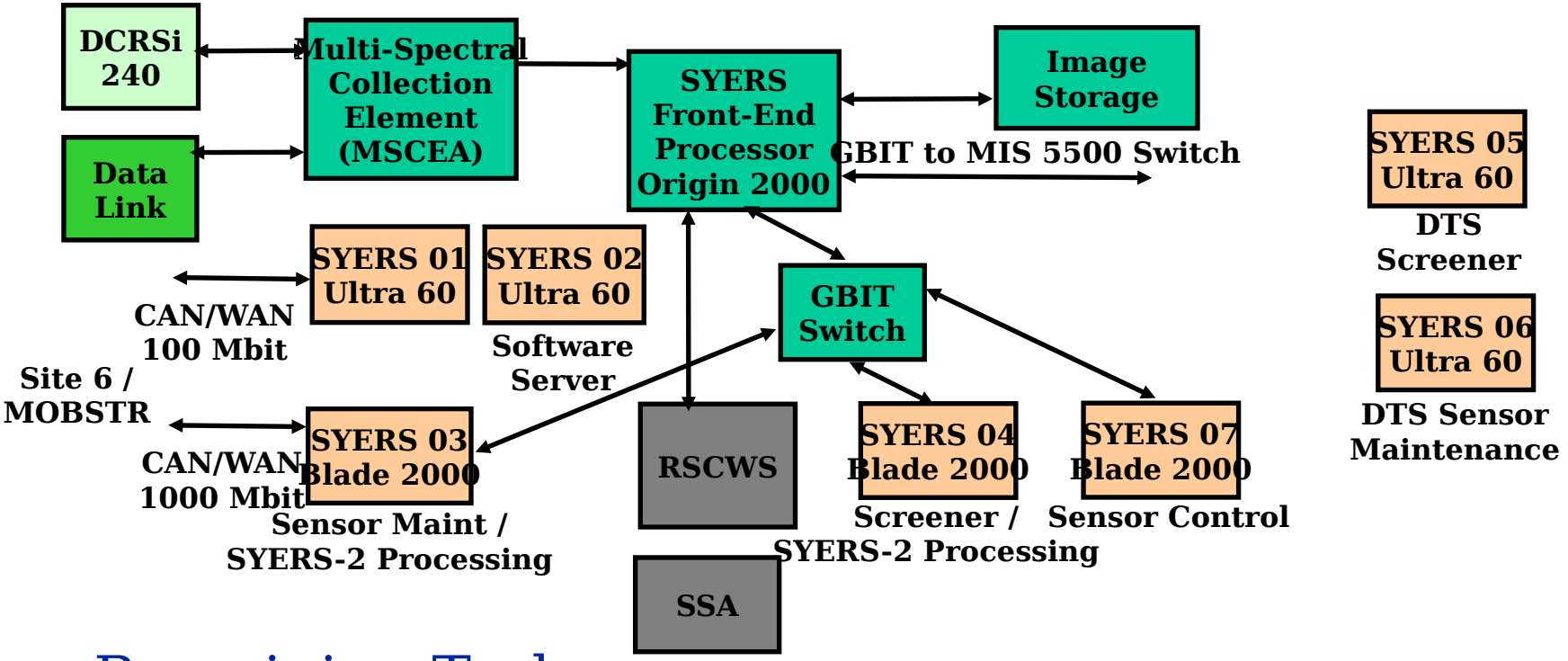


- Status
  - Weekly SYERS-2 Rings
- Remaining Tasks
  - Support End-To-End U-2 SEIT - Provided SYERS-2 MOBSTR Test Plan
  - SSA Playback Integration

DGS-2

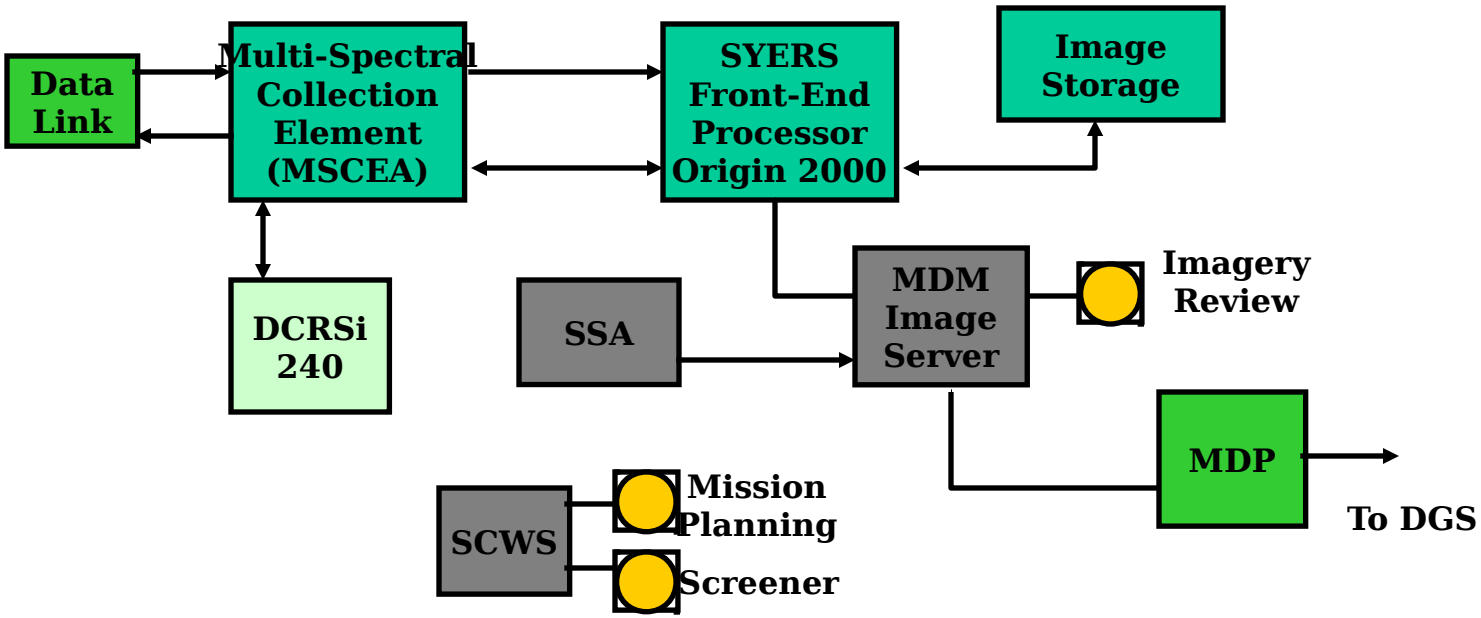
- Status
  - Upgrades coordinated with IPE Thread 1 install/test at Site-6
    - Upgrades required for SYERS backend to support upgraded ETP architecture, action boarded/approved: 1067: 04-002
  - CIES Phase 1 Integration Support
    - Activity on hold pending acceptance

DGS-2 Con't



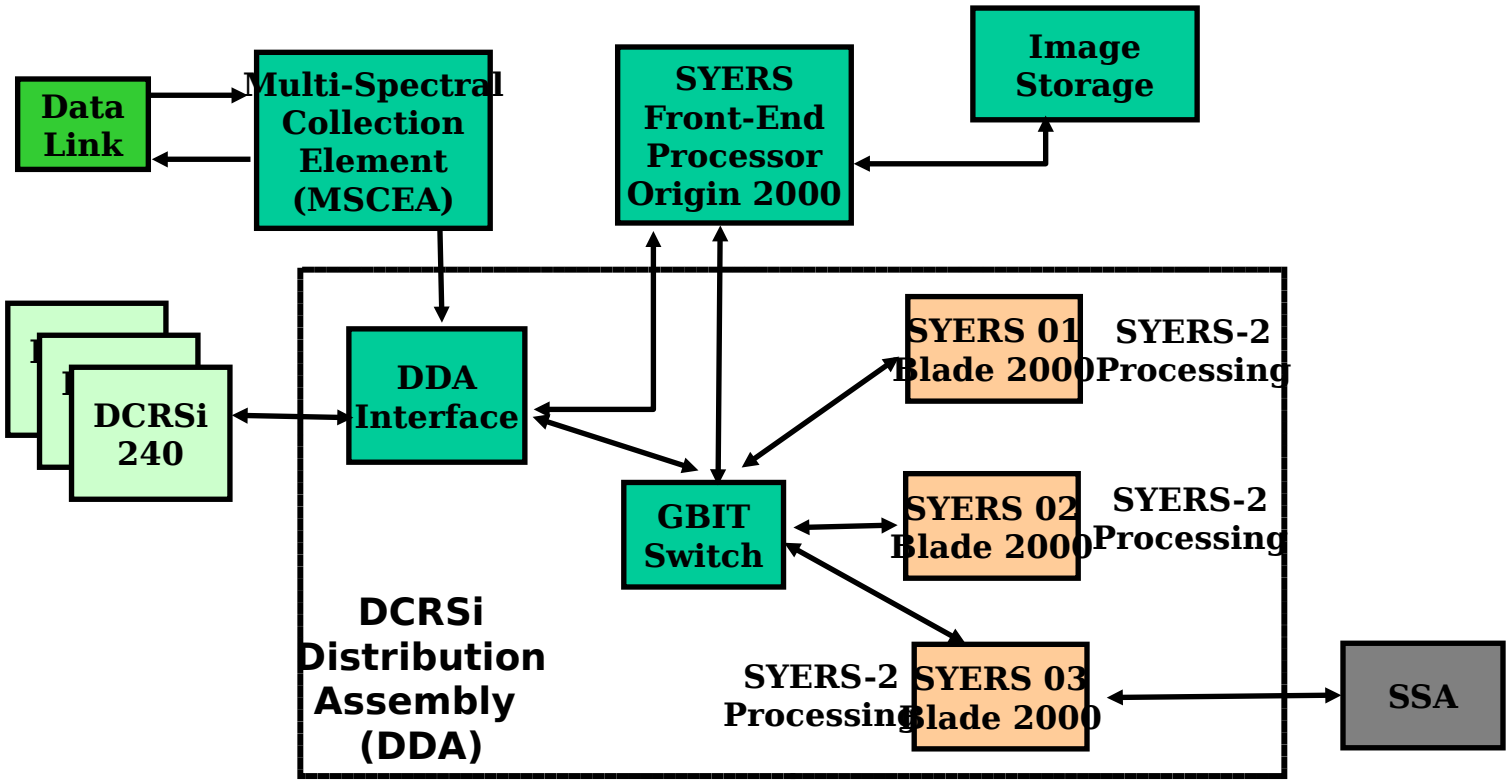
- Remaining Tasks
  - Ongoing CIES Phase1 and 2 Integration Support
  - Network Upgrades (On Going)
  - SSA Playback Integration
  - Support for 2nd Operational Thread at Site-6
  - Support Integration of CIP for LOS missions

MOBSTR A



- Remaining Tasks
  - SYERS-2 End-To-End Rings/OCF
  - SSA Playback Integration

DGS-3 Overview



- Remaining Tasks
  - Integrate the Digital Storage Tape system (TCTO Pending)
  - Install additional “on line” storage

Site 6 Overview

- Status
  - Integration support to IPE Thread Install, Test, Deployment for SYERS-2 capability
  - Integrated 2 Sensor Monitoring Work Stations to support string 1 & 2
  - Support provided to other mission partners for specific taskers
  - Issues continue to be worked relative to sensor/CIP/IPE troubleshooting, FSR access to sensor
- Remaining Tasks
  - Outstanding issues relative to DGS backend and Site-6 CIP/IPE being worked
  - Integration / Test support to 2nd Thread
  - Integration support for CIP V6.6 build (Multi-Band NITF Product) to support RARE ACTD, MASINT Cells

DGS 4/DET 1

- Status
  - Integration of CIP in process at DET 1/FOL
  - Integration of DGS modifications to support SYERS/SYERS-2 missions (DET1-to-DGS4) accredited at DGS-4
- Remaining Tasks
  - Complete Integration at DET1/FOL
  - Perform end-to-end Testing & Accreditation
  - Support OCF’s / Initial Operational Deployment

SYERS-2 FTF

- Status
  - Integrated CIP into FTF architecture
    - SYERS-2 flight tests now performed with CIP (SFEP Shadow mode)
  - Test &Integration IPE/CIP/DGS architecture prior to IPE fielding at Site-6
  - Integrated / Tested 2nd CIP prior to deployment to DET1/FOL
  - Support to special taskings
- Remaining Tasks
  - Ongoing testing/integration (CIES, B10.2)
  - ATM efforts
  - Additional CIP/IPE/DGS testing
  - KIT 105 Flights (Fall 04)
  - Flight test support for Improved Geo, EO MTI, BE Finder, Advanced Exploitation Toolbox, MSI Spectral Analysis, & Thermal Processing

Program Issues

RX/TX Module Availability

Funding

Issues/Concerns: RX/TX

- RX/TX Module availability (GFE units)
  - Kit 105 has “questionable” units (5/Sensor; 7/T&C)
    - may need up to 12 replacements to complete I&T
  - None available for kit 106
    - Need 12 units to build kit
  - No longer required once ATM is added to SYERS-2
    - Except if required to make T&C BWC
  - Additional units required if 105 and 106 are to be completed and deployed before ATM conversion
  - LX reviewing if retired Legacy SYERS systems can be a source of RX/TX modules

Issues/Concerns: Funding

- Funding Shortfalls
  - Vanishing Vendor – Visible Focal Plane Array
    - Requires qualification of new vendor
    - Goodrich has identified 3 viable options with a recommendation
  - SYERS-2 Depot Test Bed
    - Funded, Phase I in place Mar 05
    - Phase II negotiated, funds on hold (3600)
  - Flight test support for Install Kit 106